Research

Patient Characteristics, Screening Use, and Health Education Advice in a Chiropractic Practice-Based Research Network

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Abstract

Objective: to replicate questions from the National Ambulatory Medical Care Survey (NAMCS) in a sample of Doctors of Chiropractic (DCs) in a practice-based research network (PBRN) to assess the feasibility and appropriateness of the survey instrument for a larger study focusing on prevention and health promotion-related practices.

Methods: The study population consisted of volunteer DCs in the Integrative Chiropractic Outcomes Network (ICON) PBRN. DCs recorded data on each patient who presented in their office during one designated day. Data were collected on chief complaints, screening procedures, diagnosis, and health education advice.

Results: 530 patient visits were captured from 27 DCs in 21 practices. The most common complaint was back pain, and over 80% were established patients. Ordering of screenings on the day of the visit was infrequent, including radiography (4%). Most patients paid with private insurance (61%). Nearly half (49%) presented for a new complaint and only 4% for preventive care. 10.5% of the patients were recorded as tobacco users and over 65% were overweight or obese. Advice on physical activity/exercise was suggested to over 60% of patients. While

specific advice on weight management was provided to only 11.5% of obese patients, 74% of obese patients received advice on diet, exercise or weight reduction. Only 9.8% of tobacco users were offered cessation advice that day.

Conclusions: Adaptations of the survey may be necessary to reflect chiropractic practice style, in which patients make multiple visits. Methods to encourage DCs to adopt health promotion and disease prevention advising guidelines may be warranted.

Introduction

The Integrated Chiropractic Outcomes Network (ICON) is a practice-based research network (PBRN) registered with the Agency for Health Care Research and Quality (AHRQ). The primary purpose of ICON is to conduct collaborative research related to chiropractic and enhancement of health of the public and assessment of health promotion and disease prevention measures delivered within the practice-based setting. Demographic descriptions and the location of ICON doctors, the initial description of the types of patients they see and services they render are described elsewhere.[1]

The National Ambulatory Medical Care Survey (NAMCS) collects data from American doctors of medicine (MD) and osteopathy (DO) on patients' presenting complaints, and the diagnoses, diagnostic tests, medications, health education and other aspects of patient management provided to each patient on a given day.[2]

In addition to current health history of the patient, past history, smoking or tobacco use history, the NAMCS also asks about disease screening and health education advice rendered to patients on the visit recorded. However, the NAMCS does not include doctors of chiropractic (DC). While DCs are not conventionally considered primary care physicians, the purpose of this study was to replicate questions from the NAMCS survey relevant to prevention and health promotion services as they may pertain to chiropractic practice and to assess the survey instrument and administration as a pilot for a larger study on this topic.

Methods

This was a descriptive cross-sectional study conducted in participating ICON doctors' offices on a single day in usual practice.

Study Population

The study population consisted of all DC ICON members who agreed to participate. ICON members must be in active practice in the U.S. and have signed the participation agreement.

Human Subjects Protection. The project was approved by each Institutional Review Board at the collaborating institutions making up the ICON PBRN prior to enrollment of doctors into the study. Participation agreements including the elements of standard informed consent and describing the program's methodology for protecting doctor and patient confidentiality were required to be signed by both the chiropractors and ICON program director prior to the initiation of data collection. All data collected was identified only by the DC's identification number; patient data recorded by the DC were completely anonymous.

Data Collection

For this study, we collected data from the participating DCs only, not from patients. The study period was a single day of the doctor's choice during the week of Oct. 3-7, 2011. The DC was instructed to complete one data collection form for each patient that day, after the visit was completed. Hard copy forms were mailed to each office and were returned to the ICON central office in stamped, self-addressed return envelopes.

Data Collection Instrument. The form was a single page using questions modified from the NAMCS, which has been used for medical and osteopathic physicians, but not DCs. The questions were either identical to those on the physician survey or very similar, omitting the questions unrelated to or outside the scope of chiropractic practice. For this study, questions about specific treatment were excluded since the focus was on prevention and health promotion services. Participants were asked to mark exams performed that day that could be related to prevention, imaging or other tests performed on the day of the visit. These exams included breast, foot, pelvic, rectal, retinal, skin or depression screening; x-ray, and other imaging and blood tests associated with preventive screening. The data collection form is shown in its entirely as **Figure 1**. These questions are related to diagnosis, disease prevention and health promotion screening and counseling as well as referral/comanagement that had been provided on that visit.

Figure 1 Data Collection Instrument.

Click here to view PDF.

Data Management and Analysis

The Program Coordinator (PC) instructed each participating DC and his or her designated staff over the phone and/or via email communications on data collection protocols, also providing each office with printed instructions.

ICON used its established data coordinating system.[1] Data are stored in a secure Microsoft Excel database and transferred to SPSS version 16.0 for verification. Data were verified using an SPSS double-entry verification program. Hard copies were subsequently filed in a secure, fire-resistant cabinet.

Data analysis. We calculated body mass index (BMI) for all patients for whom height and weight were recorded, using the standard formula. [3] We calculated hypertension as presence of a recorded systolic blood pressure > 139 and diastolic > 89.[4] We computed descriptive statistics for variables using SPSS v. 16.0 as well.

Results

Patient Characteristics

Data collection forms were completed for 530 patients of 27 doctors in 21 practices in 12 states (FL, IL, MA, MD, ME, MO, MN, NC, OH, TN, TX, VA). The mean number of patients doctors reported on, for the data collection day, was 20 (range 5-54); the mean per practice was 24 patients (range 5-63). **Table 1** summarizes the demographics and other patient characteristics. The majority of patients (60.6%) seen were female and most were white (82%). The mean age of the patients was 44.6 years; about 15% were new patients and 82% were established patients. About one third (32.5%) stated the patient was referred for the visit. The most common reason for the current visit was a new problem with onset less than 3 months ago (48.9%), with preventive care reported for only 4.2% of patients. As shown in **Figure 2**, for most patients the expected source of payment reported was private insurance (61%).

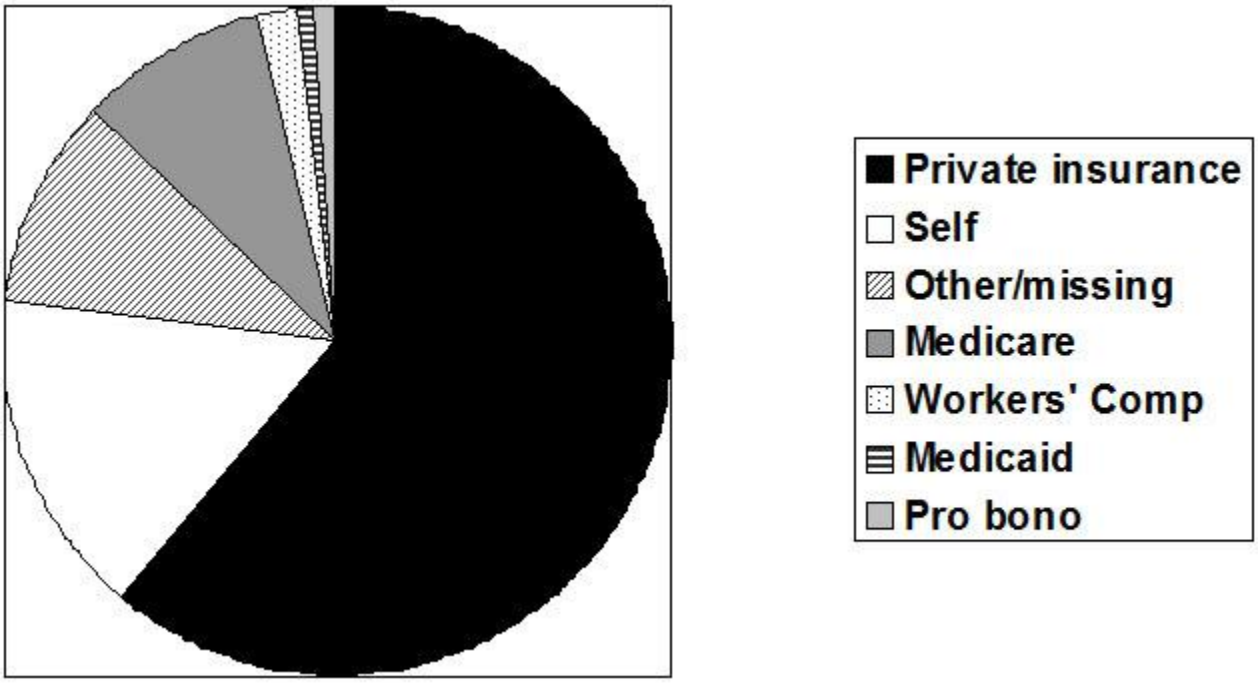
Table 1. Patient characteristics (n=530).*

Characteristic	Frequency	%
Gender		
Female	321	60.6
Male	195	36.8
missing	14	2.6
Race		
White	435	82.1
Black/African American	53	10.0
Asian	16	3.0

Native Hawaiian/Pacific Islander	2	.4
American Indian/Alaska Native	3	.6
missing	21	4.0
Ethnicity—Hispanic	28	5.3
Age—mean, 44.6 years (minimum 10 months, maximum 94 years)		
Reason for visit		
New problem (onset < 3 months)	259	48.9
Chronic problem, routine	101	19.1
Chronic problem, flare-up	90	17.0
Preventive care	22	4.2
Pre/post surgery	12	2.3
missing	46	8.7
Patient was referred for this visit	172	32.5
Patient was referred to another physician	15	2.8
Patient status		
Established patient	436	82.3
New patient. (first visit)	78	14.7
missing	16	3.0

* Numbers are frequencies and percentages unless otherwise specified.

Figure 2. **Expected source of payment for study patients.**



As shown in **Table 2,** 10.5% of the 487 adult patients (aged 18 years or older) were recorded by their DC to be current tobacco users. Concerning body mass index (BMI), 411 of the 487 adult patients (84.4%) had height and weight recorded from which BMI could be calculated. Of those 411, 34.3% were overweight and 31.9% were obese. Of the 489 adult patients, the DCs actually recorded BMI as well as height and weight for 259 (53.2%) patients. For these, 28 (11%) of the doctor-recorded BMIs differed from the SPSS-calculated BMI by > 1 point (median, 4.5; range, 2-18). Concerning blood pressure, 347 of 487 (71.3%) adults had BP recorded and one entry was deleted as an artifact (diastolic blood pressure was recorded as 6). For the 346 adult patients with recorded systolic and diastolic blood pressure, 22 (6.4%) were hypertensive the day of the survey.

Table 2. Tobacco use and body mass index (BMI) of adult patients (n=487).

Tobacco use	Frequency	Percent
Current	51	10.5
Do not currently use	407	83.6
Unknown/missing	29	5.9
BMI category (n=411*)	n	%
<18.5 (underweight)	4	1.0
18.5-24.9 (normal)	135	32.8
25-29.9 (overweight)	141	34.3
30+ (obese)	131	31.9

* 411 of 487 adult patients had height and weight recorded from which BMI could be calculated.

Comorbidities

As shown in **Table 3**, the patient comorbidities most frequently listed were arthritis (26.6%) and hypertension (14%). Obesity was recorded as a comorbidity for 12% of patients and asthma for 8%.

Table 3. Comorbidities recorded (n=530).

Condition	**n**	**%**
None of those listed	297	56.0
Arthritis	141	26.6
Hypertension	74	14.0
Obesity	65	12.3
Asthma	42	7.9

Depression	32	6.0
Hyperlipidemia	29	5.5
Diabetes	24	4.5
Osteoporosis	9	1.7
Ischemic heart disease	8	1.5
COPD	6	1.1
Cerebrovascular	4	.8
Congestive heart failure	2	.4
Chronic renal failure	1	.2

Chief Complaint

Low back pain was the most common chief complaint (36.6%), followed by neck pain (22.1%), shoulder pain (5.7%), mid-back pain (5.1%) and extremity pain (4.4%). Pain-related complaints comprised 92% of all chief complaints. Only 4.5% of conditions listed were wellness-related; these included maintenance care (3.0%), strength/performance improvement (0.9%), and nutrition consult (0.6%).

Diagnosis

There were 88 diagnostic terms applied to the patients in this assessment. The most common were related to the chief complaint of cervical spine-related diagnostic codes at 29.3% of diagnoses. Other less specific codes could have included cervical spine diagnoses as well such as radiculopathy but this was not specific to a region in many cases. Lumbar-related codes made up the second most specific list of codes with 28.7%. These included diagnostic terms such as sacroiliac dysfunction, lumbosacral dysfunction, lumbalgia, sciatica, lumbosacral sprain, and lumbar sprain. However, several other diagnostic terms less specific could have also been applied to the lumbar region including facet syndrome or foraminal stenosis but were not specifically stated as such. Thoracic spine segmental dysfunction made up only 0.4% of diagnoses and headaches were diagnosed more with general headache making up 1.9% of them. The traditional chiropractic diagnosis of subluxation was only made in 1.9% of patients.

Examination and Screening

About 67% stated no exam was done on that day; 4.3% said they x-rayed the patient and 1% ordered an

MRI. Less than 1% ordered bone mineral density, CT scans, or ultrasound. Less than 4% performed complete blood counts (CBC), blood glucose, hemoglobin A1c (HbA1c), or lipids/ cholesterol screening. None ordered a prostate specific antigen (PSA) test, mammogram or an echocardiogram, and 4% stated they ordered "other" (unspecified) blood tests.

Health Education Ordered

As shown in **Table 4**, the most common health education advice reported was exercise with just over 60% stating they gave this advice on the visit day. Of 141 patients who were overweight, 63% received advice on exercise, and of the 131 patients who were obese, 68% received advice on exercise. About 23% were given advice on diet and nutrition and among those who were overweight, 24% got advice on this topic with 28% of obese patients receiving this information. Specific information on weight reduction was only provided to 4.2% of patients including only 2.1% of those overweight and 11.5% of those who were obese. However, 74% (97) of obese patients received advice on diet or exercise or weight reduction. Among the 51 reported tobacco users, 9.8% were given advice on tobacco use or cessation.

Table 4. Health promotion ordered or provided at current visit (n=530).*

Topic	frequency	%
None	51	9.6
Exercise	321	60.6
overweight adults (n=141)	89	63.1
obese adults (n=131)	89	67.9
Injury prevention	147	27.7
Diet/nutrition	124	23.4
overweight adults (n=141)	34	24.1
obese adults (n=131)	37	28.2
Stress Management	39	7.4
Weight reduction	22	4.2

overweight adults (n=141)	3	2.1
obese adults (n=131)	15	11.5
Growth/Development	20	3.8
Tobacco Use/exposure	6	1.1
Current tobacco users (n=51)	5	9.8
Asthma education	2	0.4
Family planning/contraception	0	0
Other, unspecified	25	4.7

* n=530 unless otherwise specified.

Discussion

Examination and Diagnosis

First, it is interesting to note that once again, the most common conditions seen by doctors in the ICON group are those most commonly seen by DCs and perhaps the conditions they treat best. According to the National Board of Chiropractic Examiners (NBCE) surveys, back and neck pain are the most common reasons patients see DCs.[5] Also, demographically, patients appear similar to what are described as typical patients by NBCE survey results.

Next, in 67% of patients no exam was performed on the visit date. Although this could be due to a majority of patients being seen for a routine visit within an established treatment plan, this statistic seems unusually high. Eighty-two percent were established patients but almost 50% were being seen for a new problem of <3 months duration. We would have expected to see higher levels of examinations reported among the cohort.

In the area of examinations it is interesting to see that only 4% x-rayed their patient. While this group of providers could be guideline-oriented, there was a time when radiographs were extensively utilized by DCs. This observation could reflect the same situation mentioned above related to the majority of visits involving ongoing care or it could indicate a reduction in utilization of x-rays based on more recent studies suggesting limitations in diagnostic value among routine spine patients.[6]

As to levels of preventive screening in this sample, on a single day in the practice, little screening was reported. This was disappointing but not unexpected as 3rd party payers (a vast majority reported payment of the visit was from 3rd party payers) do not routinely reimburse DCs for these services. While reimbursement may be an issue it would seem that any provider should routinely record blood pressure, height, weight and BMI. It is therefore of some concern that in almost 30% of surveys, blood pressure was not recorded, implying it was not taken on this or a previous visit. Although height and weight was recorded for most (84.4%) adult patients, the DCs only recorded BMI for 53.2% of patients, and 11% of those doctor-recorded BMIs were incorrect. It should also be noted that the nature of chiropractic care is that patients are often seen for several visits for a condition and some screening may occur on subsequent or prior visits. However, these issues may indicate areas where more education may be needed for DCs related to screening on health risks.

Obesity as a Health Issue

The doctors in the study identified only 12% of patients as obese in the section related to comorbidity, where obesity was a choice. However, taking the supplied height and weight available on 411 surveys and calculating BMI via the SPSS software, about 32% would be in the obesity range based on BMI and another 34% would be overweight. Combined with the fact that only 53.2% of adult patients had recorded BMIs, this indicates another area where further study may be needed.

Health Education

The engagement level of DCs on healthy promotion advice was less than optimal. Regarding overweight and obesity, we observed a minority of patients getting specific advice on nutrition and diet or healthy weight. Only 2% of those who were overweight and 11.5% of those who were obese were advised on weight management, and 9.8% of tobacco users were counseled on cessation. It is possible that the doctors advised them on another visit. However, health messages should and can be reinforced briefly at each subsequent visit. The US Center for Disease Control and Prevention urges clinicians to advise cessation on every visit when a smoking patient is seen.[7]

Exercise advice was slightly higher for those who were overweight or obese than in the general patient base but all of those levels exceeded 60%. Prior studies [8,9] have indicated that DCs are very likely to give advice on exercise but they do not always differentiate between fitness exercise and corrective/rehabilitative exercise. In fact, even though the proportion of obese patients who received specific counseling on weight management was low, 74% of obese patients received advice on diet *or* exercise *or* weight reduction.

There are unique opportunities for DCs to engage patients on health education simply due to the frequency of visits and the rapport they have with established patients. A tremendous opportunity for utilizing a dose-response effect may be being overlooked. These data point to many opportunities to do better. Recent studies in primary care indicate, for example, a brief lifestyle counseling session with patients can result in statistically significant reductions in unhealthy weight. [10] And with an obesity epidemic all providers should be doing everything possible to address this with patients at risk. Comparing our sample to national rates for counseling in conventional primary care practice,[11] our

sample of DCs appear to be doing less counseling on tobacco use (19% for primary care medicine, and about 10% in our sample), about the same in terms of recording BMIs (49% of adults in primary care medicine and 53% in our sample), and much better for providing diet, exercise and/or weight management counseling to obese patients (29% of obese patients in primary care medicine and 74% in our sample).

Limitations of the Study

This is a cross-sectional study limited by the nature of such designs. For example, we were only able to record what a provider did that day; it is possible that procedures took place at other visits. Unlike medical care, for which the NAMCS was developed, chiropractic care is typically provided in a sequence of visits rather than a single visit. Thus, it is possible that the survey results, in reflecting only one visit, may have failed to capture procedures that were done on previous or subsequent visits. In order to more accurately reflect chiropractic practice, future evaluations could ask if the service was done within the last 30 days, for instance.

While recall bias is limited in an assessment where the participant is asked to record visits for the current day, it is still possible that doctors in a busy practice wind up completing the forms at the end of the day and may recall incorrectly. Also, errors in recording can occur, such as misclassification of those who are obese or overweight and this probably occurred in this assessment. Otherwise, it is difficult to explain variation in BMI between those calculated by the doctor and those we calculated with SPSS software. Missing data may also be a limitation. Finally, selection bias is unavoidable in practice-based research; ICON doctors represent a unique subset of doctors who are willing to give their time in the name of research following a structured set of guidelines set forth by PBRNs. That makes the research less generalizable to the standard chiropractic practice and we acknowledge that here as a limitation.

Conclusion

Visits to DCs in this PBRN are for conditions routinely seen by the chiropractic profession. Back pain, neck pain and other musculoskeletal conditions are the most commonly reported chief complaints and diagnoses. Comorbidities common to Americans were seen in this study as well. In this one visit snapshot, preventive exams, screenings, x-ray utilization were low. Health education engagement was also low although exercise was commonly recommended. Typically, doctors reported some type of 3rd party pay as most common for the patient visit and that was usually health insurance.

Future studies could consider whether screenings or health education advice was rendered within the last 30 days and education and dissemination projects could focus on developing methods to increase DCs' engagement of patients on preventive screening and health-related advice.

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